

Remarks/Arguments

Applicants reply to the Final Office Action dated February 3, 2009, within two months. The Examiner rejected claims 1, 3-11, 13-23, 25-29 and 42-47 pending in the application. Claims 1, 3-11, 13-23, 25-29 and 42-47 (5 independent claims; 32 total claims) remain pending in the application. Support for the amendments may be found in the originally-filed specification, claims, and figures. Reconsideration of this application is respectfully requested.

Examiner's Response to Previously Presented Arguments and Interview Summary

Preliminarily, prior to addressing the Office Action's response to Applicants previously presented arguments and as discussed in the Examiner interview on March 17, 2009, Applicants respectfully submit that the claims as currently recited differ from the references of record in that sections of a porous material to be densified are placed into multiple containers for holding the porous material ("modules") and those modules are continuously loaded into a CVI chamber where densification then occurs, resulting in improved processing throughput. As discussed, Applicants submit that even assuming that continuous processing and the use of "modules" may be contemplated by certain portions of the cited art (though Applicants do not mean to imply agreement with this assumption), Applicants submit the references fail to teach continuous processing using modules as contemplated in the present claims, at least in part because continuous processing would be impossible using any combination of the configurations disclosed.

That being said, in response to Applicants' arguments presented on December 9, 2008, the Office Action contends the Applicants' argument, that Froberg teaches away from placing a porous material into a module prior to densification, is without merit and further asserts that Golecki teaches that a porous material is loaded into a graphite cylindrical susceptor for subsequent densification, and characterizes this susceptor as a "module." The Office Action continues, stating that Golecki teaches that densification can be conducted in one step (a batch system) or through a continuous process by a straightforward extension of the batch system.

As discussed in more detail below, Applicants submit that the forgoing characterization of Froberg and Golecki is not accurate. First, Froberg does not disclose a module at all, and second, with respect to Golecki, the disclosed graphite cylindrical susceptor simply is not a "module." Specifically, Golecki teaches that the porous material surrounds the susceptor. In

contrast, the claims clearly recite that the porous material is placed into (within) the module. Additionally, because the purported “module” of Golecki is the mechanism for heating by induction and because it is mounted securely within the chamber, it cannot easily be extended into a continuous, moving system.

Accordingly, in light of the above comments and the discussion below, Applicants submit the claims as currently recited are patentable over the cited art of record.

§ 102 Rejections

Claims 45 and 47 are rejected under 35 U.S.C. § 102(b) as being anticipated by Purdy et al. (U.S. Publication No. US 2001/0019752). Specifically, the Office Action contends that Purdy teaches the placement of a porous material into a module, loading the module into a CVI processing chamber, preheating a reactant gas and introducing the gas into the CVI chamber to densify the porous material. Applicants respectfully traverse.

Applicants note that claim 45 has been amended to clarify that multiple modules are continuously loaded into the CVI chamber. Specifically, in this regard, claim 45 recites “a plurality of modules, [which are] continuously loading the modules into said CVI chamber.” As noted on page 13, lines 8-12 of Applicants’ specification, this beneficially allows for improved processing throughput because:

Processing multiple sheets or modules can improve the processing throughput without a significant impact on the overall cycle time needed to obtain the desired density because of the uniform gas flow, composition and rate that can be achieved across each layer of sheet in the module as well as the various modules, themselves.

In contrast, Applicants submit that Purdy offers no teaching or disclosure of continuously loading a plurality of modules into a CVI chamber or the benefits that derive therefrom, but rather is generally directed only to non-continuous (batch) processing.

Moreover, Applicants submit that Purdy does not disclose “modules” as contemplated by the currently presented claims. Nonetheless, assuming for argument’s sake that the structure of Purdy which encloses the porous structure to be densified can be characterized as a “module,” this “module” is secured within the reaction chamber, and no means is contemplated, or even

possible, which would allow for the continuous movement required for the continuous processing provided for in claim 45.

Last, Applicants note that claim 47 has been canceled, thus obviating any rejections of this claim. Accordingly, given the cancellation of claim 47, and because Purdy fails to teach each and every element of claim 45 and its dependent claim 46, Applicants therefore submit both claims are not anticipated. Therefore, Applicants respectfully request withdrawal of the §102 rejection of claims 45-47.

§ 103 Rejections

Claims 1, 3-11, 13-20, 22, 23, 25-29, and 42-44 are rejected under 35 U.S.C. §103(a) as being unpatentable over Froberg (U.S. Patent No. 3,944,686) in view of Purdy et al. (U.S. Publication No. 2001/0019752) and Golecki et al. (U.S. Patent No. 5,348,774). In making the foregoing rejections, the Office Action contends that Froberg discloses passing an elongated continuous porous sheet through a CVI chamber. The Office Action also notes that Froberg discloses cutting the porous sheet into a number of separate sheets. The Office Action then makes the assumption that it would have been obvious to one skilled in the art to place the cut pieces into a module or container to store or ship the densified porous material. In support of this contention, the Office Action provides Purdy as evidence of placing porous materials into modules for densification processes. As discussed below, reliance on these contentions is misplaced and Applicants traverse.

First, as noted above, as presently recited, each of the independent claims 1, 11, 23, and 26, and their dependent claims, provide for multiple modules that are continuously loaded into the CVI chamber for densification. In contrast, Froberg provides no disclosure of a “module” and as such, cannot disclose a “plurality of” or “multiple” modules.

Second, the Office Action’s reliance on col. 3, lines 35-40 of Froberg as teaching that the porous sheet is divided into a number of pieces by a cutter completely disregards the fact that the cutting of Froberg occurs after densification. This is in direct contradistinction to the present claims which require that the porous material already have been divided into separate pieces and placed in a module prior to densification (placement in the CVI chamber). Thus, the Office Action’s conclusion regarding the placement of densified porous sheets in a module for storage and shipping has no bearing on claims as presently recited.

Further still, the reliance on Purdy as disclosing the placement of porous materials in modules for densification is likewise misplaced. As noted above, Applicants submit that Purdy does not disclose “modules” as contemplated by the presently presented claims. However, even assuming for arguments sake that the structure of Purdy which encloses the porous structure to be densified can be characterized as a “module,” this “module” is quite clearly secured within the reaction chamber, and no means is contemplated or even possible, which would allow for the continuous movement required for the continuous processing provided for in the claims as presently recited.

The Office Action’s reliance on Golecki is likewise in error. The Office Action refers to Golecki as teaching a porous material being loaded into a graphite susceptor for densification and concludes the susceptor is a “module.” Applicants disagree. The portion of Golecki to which the Office Action refers as disclosing a “module” actually states that the substrate is “mounted around a conducting cylindrical mandrel or susceptor 3.” (Emphasis added). As is stated in the written description and illustrated in Figure 1 of Golecki, the porous material surrounds the susceptor. As is clear from the claims as recited, the porous material must be placed within a module. As such, Applicants fail to see how the susceptor disclosed in Golecki is the same as the “module” as presently recited in the claims. Further still, because the purported “module” of Golecki is a mechanism for inductive heating and because it is mounted securely within the chamber, it cannot easily be extended into a “continuous” system as is presently claimed.

Thus, in contrast to Froberg, Purdy and Golecki, claim 1 recites “a plurality of modules, [and] continuously loading the modules into said CVI chamber 2;” claim 11 recites “placing said porous material into multiple modules, [and] continuously loading the modules containing said porous material into said CVI chamber;” claim 23 recites “placing said layers of porous material into a plurality of modules, [and] continuously loading the modules containing the layers of porous material into said CVI chamber;” and claim 26 recites “placing porous material into a plurality of modules, [and] continuously loading the modules into said CVI chamber.”

Accordingly, because Froberg, Purdy and Golecki fail to teach each and every element of independent claims 1, 11, 23, and 26, whether alone or in combination, Applicants submit that these claims are not rendered obvious by the references. Similarly, claims 3-10, 13-22, 25, 27-29, and 42-44 which variously depend therefrom are likewise not rendered obvious by the

references for the same reasons as set forth above, in addition to their own respective features. Therefore, Applicants respectfully request withdrawal of the §103 rejection of claims 1, 3-1, 13-20, 22, 23, 25-29, and 42-44.

Applicants also note claim 21 is rejected under 35 U.S.C. §103(a) as being unpatentable over Froberg in view of Purdy and Golecki as applied to claim 11 above, in view of Sekiya et al. (JP 408002976A). Applicants traverse. Claim 21 depends from claim 11 which, as noted above, Applicants submit is allowable over Froberg, Purdy and Golecki. Applicants submit that Sekiya fails to cure the deficiencies of Froberg, Purdy and Golecki as applied to claim 11, and thus submit that claim 21, as dependent on claim 11, is likewise not rendered obvious by the cited references. Accordingly, Applicants respectfully request withdrawal of the §103 rejection of claim 21.

Finally, Applicants note claim 46 is rejected under 35 U.S.C. §103(a) as being unpatentable over Purdy in view of Fisher et al. (U.S. Patent No. 6,083,560). Applicants traverse. As noted above, claim 46 depends from claim 45, which as noted above, Applicants submit is allowable over Purdy. Applicants note that Fisher fails to cure the deficiencies of Purdy as applied to claim 45, and thus submit that claim 46 as dependent on claim 45 is likewise not rendered obvious by the cited references. Accordingly, Applicants respectfully request withdrawal of the §103 rejection of claim 46.

CONCLUSION

In view of the above remarks and amendments, Applicant respectfully submits that all of the currently pending claims 1, 3-11, 13-23, 25-29, and 42-46 (5 independent claims, 31 total claims) properly set forth that which Applicant regards as his invention and are allowable over the cited prior art.

Accordingly, Applicant respectfully requests reconsideration and allowance of all pending claims. The Examiner is invited to telephone the undersigned at (602) 382-6337 at the Examiner's convenience, if that would help further prosecution of the subject Application. Applicant authorizes and respectfully requests that any fees due be charged to Deposit Account No. 19-2814. **This statement does NOT authorize charge of the issue fee.**

Respectfully submitted:

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